



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Roger WHATMORE et al.

Group Art Unit: 2816

Application No.: 10/031,239

Examiner: K. Wells

Filed: April 2, 2002

Docket No.: 111677

For: ELECTRIC FILTER COMPRISING A PLURALITY OF THIN FILM BULK
ACOUSTIC RESONATORS

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the January 4, 2005 Office Action, reconsideration of the application is respectfully requested in light of the following remarks.

Claims 1-15 are pending in this application. The Office Action, in paragraph 3, rejects claims 1-16 [sic] under 35 U.S.C. §103(a) as being unpatentable over what is alleged to be Applicants' admitted prior art, specifically Fig. 9, in view of U.S. Patent No. 4,398,162 to Nagai, and further in view of either U.S. Patent No. 5,920,243 to Ishikawa et al. (hereinafter "Ishikawa") or U.S. Patent No. 5,770,988 to Goto et al. (hereinafter "Goto")¹. This rejection is respectfully traversed.

The Office Action asserts that the new limitation that the FBARs have top and bottom electrodes, with the top electrode having a coplanar wave-guide structure does not define patentably over "Applicants' admitted prior art Fig. 9" when combined with the other applied

¹ Claim 16 was canceled by the October 1, 2004 Amendment.

references. Specifically, the Office Action asserts that the two newly cited references to Ishikawa and Goto each show a well-known FBAR structure having top and bottom electrodes with, the Office Action alleges, the top electrode having a coplanar wave-guide structure.

Claim 1 recites an electric filter comprising a plurality of thin film bulk acoustic resonators (FBARs) each comprising a thin layer of piezoelectric material sandwiched between a top electrode and a bottom electrode, the plurality of FBARs being linked in a series/parallel connection arrangement for which the areas of the electrodes in contact with the piezoelectric layer to form the resonators, are different between in series and in parallel FBARs, wherein: all the FBARs are disposed on one substrate; and the top electrode has a coplanar wave-guide structure.

Applicants respectfully submit that this last feature of the top electrode of each FBAR having a coplanar wave-guide structure is neither disclosed, nor would it have been suggested, by what is asserted by the Office Action to be Applicants' admitted prior art (Fig. 9) or Nagai. Further, Applicants respectfully submit that neither of the newly applied references to Ishikawa or Goto disclose, nor would they have suggested, this feature for the following reason.

A coplanar wave-guide structure is a structure in which two conductor layers for ground and one conductor layer for a central signal line, separated by gaps, are provided on the surface of a dielectric substrate. See, *e.g.*, the attached definition from *The Penguin Dictionary of Electronics*, Third Edition.

Ishikawa does not disclose an FBAR in which the top electrode has a coplanar wave-guide structure. As shown in Fig. 1 of Ishikawa, and noted in col. 3, line 63, Ishikawa discloses a half λ resonator that has a structure in which a multi-layer thin film electrode 100, a conductor 12 for an input terminal and a conductor 13 for an output terminal are provided

on the top surface of a dielectric substrate 10, while a grounded conductor 11 is provided on the underside of the dielectric substrate 10 (col. 3, line 65 – col. 4, line 26). As such, this is not a coplanar wave-guide structure.

For at least this reason, Applicants respectfully submit that Fig. 1 of Ishikawa and the related description, cannot reasonably be read to have disclosed, nor even to have suggested, an FBAR in which the top electrode has a coplanar wave-guide structure. Additionally, even as Figs. 3A-3E of Ishikawa show modifications using the multi-layer thin-film electrode, none of these figures discloses an FBAR in which the top electrode has a coplanar wave-guide structure. Finally, even as Ishikawa at col. 10, lines 7-11, teaches that the multi-layer thin-film electrode can be used for coplanar lines, there is no teaching which can reasonably be read to disclose, or even to have suggested, an FBAR in which the top electrode has a coplanar wave-guide structure.

Goto shows a resonator having a structure similar to a resonator shown in Fig. 4 of Ishikawa. Neither of these resonators can reasonably be interpreted to disclose an FBAR in which the top electrode has a coplanar wave-guide structure as is recited in at least independent claim 1.

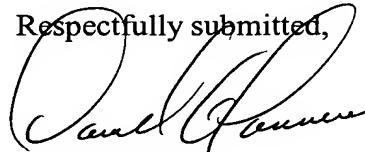
For at least these reasons, Applicants respectfully submit that the combination of the applied references cannot reasonably be read to teach, or even to have suggested, the combination of all of the features recited in independent claim 1. Further, Applicants respectfully submit that dependent claims 2-15 are also neither anticipated, nor would they have been suggested, by the combination of the applied references for at least the respective dependence of these claims on independent claim 1, as well as for the patentably distinct subject matter which each of these claims recites.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-15 under 35 U.S.C. §103(a) as being unpatentable over the combination of the applied references are respectfully requested.

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-15 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Excerpt from *The Penguin Dictionary of Electronics*, Third Edition

JAO:DAT/fpw

Date: March 31, 2005

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